FEATURES of APPLICATION of HIGH-STRENGTH MATERIALS for UNITS of the LANDING GEAR of AIRCRAFTS "AH"

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Traditionally for manufacturing the load-carrying parts of the landing gear of aircrafts "AH" a high-strength intermediate-alloy steel of grade 30ХГСН2МА-ВД, having σ_B = 1700-1900 MPa as heat treated, is used.

The maximal operation stresses in the landing gear units manufactured from the steel specified above are σ_B = 854 MPa.

At operation of aircrafts during ~ 15 years, in spite of insignificant stresses, cases of failures of parts by means of a corrosion mechanism (intergranular brittle fracture) and by means of a combined corrosion-fatigue mechanism - fatigue initiation and primary original growth of a crack with the subsequent intergranular growth of this crack and tough fracture, had taken place.

The researches carried out have shown that the failure of parts was provided by technology factors – the presence of a decarburized layer, rough traces from machining etc. Based on the analysis of operating conditions of the landing gear parts, their fractures after exploitation the followed conclusion was drawn : applied steel of grade 30ХГСН2МА-ВД as heat treated behaves on a limit of its capabilities, the steel does not have a margin of plasticity, the steel is sensitive to presence of surface defects, the steel has low corrosion resistance and is not the best material for the loaded units with long term of operation.

In connection with it, in last aircrafts "AH" for the loaded landing gear units a high-strength titanium alloy ВТ22 and maraging steel ЭК21-ВД are used which have the much greater resistance for corrosion cracking in comparison with a steel of grade 30ХГСН2МА-ВД.